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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09/902,502	07/09/2001	Kenneth A. Goldberg	LBL-CIB 1572	5914

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EXAMINER

LABAZE, EDWYN

ART UNIT	PAPER NUMBER
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2876

DATE MAILED: 07/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/902 502

Applicant(s)

GOLDBERG KENNETH A

Examiner

EDWYN LABAZE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 09 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 09 July 2001 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1 ☒ Notice of References Cited (PT 1492)
2 ☐ Drawings and Figures (PT 1493)

- 4 ☐ Interview Summary (PT 1414)
5 ☐ Notice of Extension of Patent Application (PT 1494)

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-22 drawn to the apparatus & method claims 23-34 are rejected under 35

U.S.C. 102(e) as being unpatented by Cohen et al. (U.S. 6,142,641).

Re claims 1 and 23: Cohen et al. discloses a four-mirror extreme ultraviolet (EUV) lithography projection system 1 (col 3, line 55), which includes an EUV light source 8 (col 4, lines 1+) and means for simultaneously imaging multiple points in an area of a mask blank 6 (col 3, lines 56+, and col 14, lines 28) using reflections mirrors 2,3,4,5 (col 3, lines 55+) of light from the EUV light source colliding impinging on the mask reticle 6.

Re claims 2, 8, 14, 19, 24 and 30: Cohen et al. teaches that the EUV light source consists of a synchrotron or short-wavelength (col 4, lines 2-9).

Re claims 3, 9, 25 and 31: Cohen et al. discloses that the system includes an EUV detector 46 (col 11, lines 60+).

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Re claim 7: Cohen et al. discloses that the system 1 includes means of directing EUV light to a mask reticle (col 3, lines 58+), and means for simultaneously imaging multiple points of a mask blank using reflections mirrors 2,3,4, and 5 (col 4, lines 54+).

Re claims 13 and 29: Cohen et al. teaches that the (EUV) lithography projection system 1 also includes a configuration to direct a beam of light toward a mask (col 11, lines 31+) and simultaneously image multiple points of an area using light from the EUV light source 8 (col 4, lines 1+) reflected from the area of the mask to be imaged (col 4, lines 60-67, and col 5, lines 35-54).

Re claim 18: Cohen et al. discloses that the lithography position system 1 further includes an EUV detector 46 positioned to simultaneously record the reflection from a multiple points of an area of the mask in a single exposure to the EUV light source (col 14, lines 47-67+).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Inherent disclosure is not a negative factor in the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. (U.S. 6,142,641) in view of Khursheed et al. (U.S. 6,057,553).

The teachings of Cohen et al. have been discussed above.

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Khursheed et al. teaches a portable high-resolution scanning electron microscope column 10(col.2, line 38), which includes a micro-channel plate detector 114 (col.5, lines 50+)

In view of Khursheed et al.'s teaching, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to employ a micro-channel plate detector to the teaching of Cohen et al. in order to boost the light sensitivity to the point of counting photons and intensify the signal. Micro-channel plate detectors (MCP), typically array detectors contain a plate having cylindrical channels, wherein each channel is coated with a semiconductor substance, which produces electron multiplication and gives off secondary electrons. Also MCP detectors can capture backscattered electrons for short working distances. Furthermore, such modification would have been an obvious extension as taught by Cohen et al., and therefore an obvious expedient.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al. (U.S. 6,142,641) in view of Washizuka (U.S. 5,541,416)

The teachings of Cohen et al. have been discussed above

Cohen et al. fails to disclose a pinhole filter

Washizuka teaches a method and apparatus for semiconductor light emitting element capable of inspecting wafer 100, which includes a pinhole filter 404 (col.5, lines 34+)

In view of Washizuka's teaching, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate a pinhole filter in to the teaching of Cohen et al. to allow fine focusing and precise placement of light, permit only light in a central

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free, constant irradiance coherent laser beam projected on an output plane where the amount of light is detected and measured by an optical detector. Moreover, such modification would have been an obvious extension as taught by Cohen et al., and therefore an obvious expedient

Re claims 11, 16, 21, 27, 33, and 38: See the discussions set forth in claim 5

Re claims 12, 17, 22, 28, 34, and 39: See the discussions set forth in claim 6

6. Claims 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al (U.S. 6,142,641) in view of Pierrat (U.S. 6,023,328).

The teachings of Cohen et al. have been discussed above

Cohen et al. fails to disclose a method for determining the presence of a defect in the mask blank.

Pierrat teaches a method and apparatus for inspection of mask (col. 6, lines 3-57)

In view of Pierrat's teaching, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to employ a method for determining the presence of defect in the mask because the reflectivity of the reflective coating is an important performance parameter and since defects in the multiplayer coating negatively impact the reflectivity. When using reflective masks, any mask defects may be imaged onto the photoresist layer of the substrate. One defect in a mask can result in the loss of hundred of integrated circuits chips and will affect the EUV radiation that falls within the reflective bandpass of the multiplayer, which can cause a change in the phase or amplitude of the reflected EUV radiation and anomalous exposure in the region of the sensitive material. Further, such modification would have been an

Re claim 40: See the discussions set forth in claim 5

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Re claim 37: See the discussions set forth in claim 4.

Re claim 38: See the discussions set forth in claim 5.

Re claim 39: See the discussions set forth in claim 6.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

White (U.S. 6,042,995) teaches a lithographic process for device fabrication using a multilayer mask.

Levinson et al. (U.S. 6,178,221) discloses a lithography reflective mask.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDWYN LABAZE whose telephone number is (703) 305-5437. The examiner can normally be reached on 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (703) 305-3503. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

